FORD Focus, Edge Fusion interface installation manual V100710

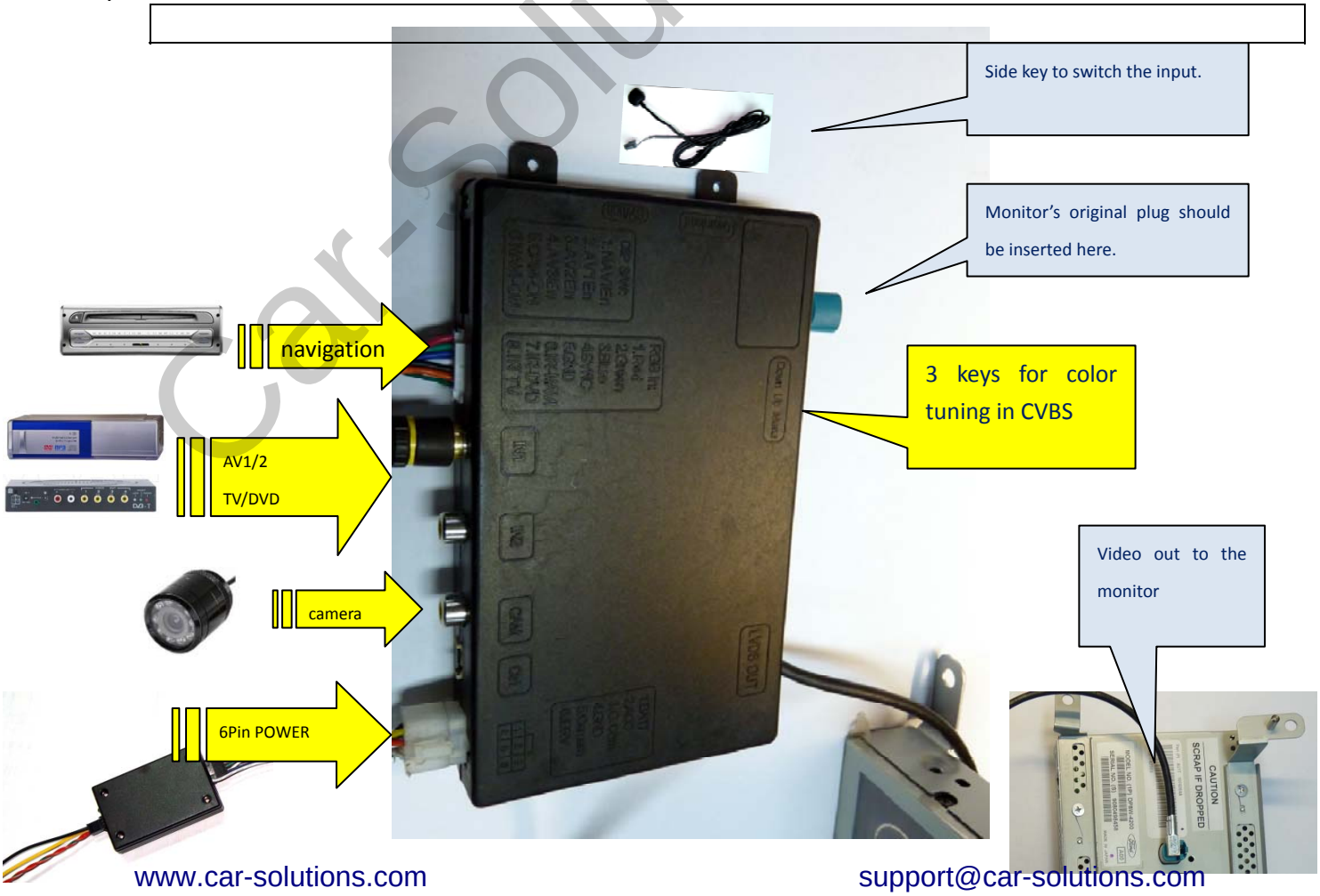
This interface can insert RGB navigation/2AV/Camera signal onto Ford Focus, Edge ,Fusion and other ford screen.

Features of this interface:

- ✓ It is compatible with all Ford 4Pin LVDS CD/screen systems which are available in Focus→, Edge ,Fusion and more, they have separate CD unit and screens.
- ✓ 64Mega dynamical memory is used inside for 2-dimensional spatial zoom and guarantee stable video signal to screen no matter what the input video source the installer use.[PAL/NTSC/No signal]
- ✓ Plug and play installation without hurting the original circuit and warranty label, Special PPS shell makes this interface stable against noise, Low EMI, and very reliable.[the black plastic shell is actually conductive]
- ✓ Optional Touch operation to installed DVD/TV tuner can be activated, so the installer can operate DVD without using the remote controller.
- ✓ Optional control port for installer's convenience to insert extra audio input to car's AUX port, also to switch the original touch screen for installed aftermarket touch devices like touch navigation computer.
- ✓ This device is car temperature verified, surge voltage stability testified .

➢ This version added the original "Navi" key to switch.

1. System connection



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Users may long press the" NAVI" key to switch the input, CAN box's 4Pin should be connected to the car's navi console connector 4Pin in this way:

Car Navi Console	CAN Box
1. Yellow/Red strip to	RED with fuse （+12V）
2. Gray/Orange--to	Blue CAN+
3. Violet/Orange---to-	Gray CAN-
4. Black -----to--	Black （GND）

CAN box output: 6Pin POWER conn. For the Interface box :

YELLOW: 12V battery power, it can also be ACC.

RED=ACC: whenthis wire goes to 12V, the interface works.

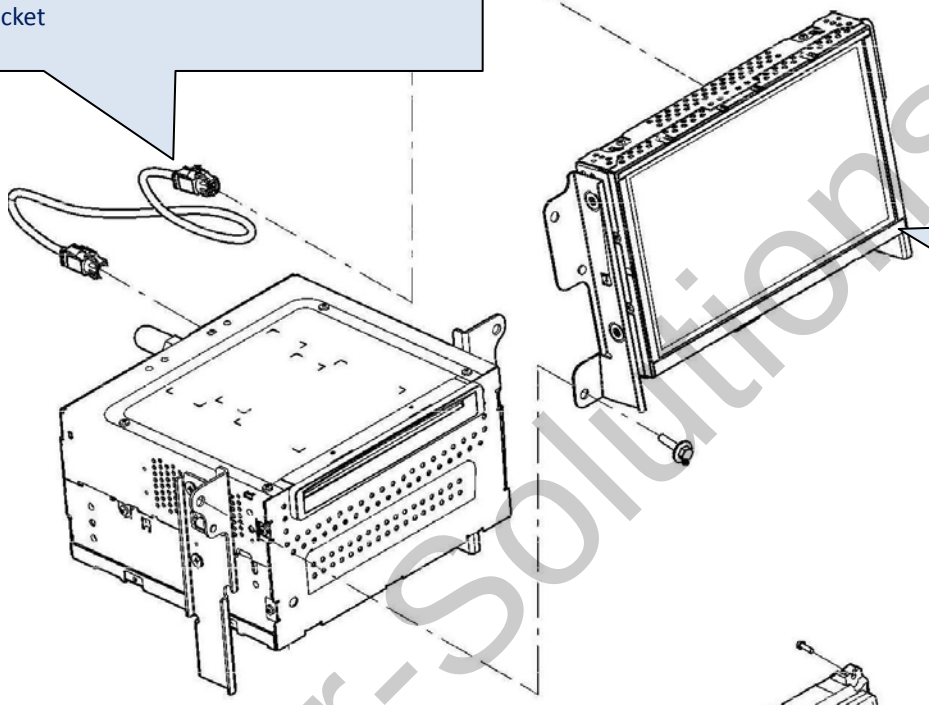
BLACK: Ground for chassis。

GREEN: go to camera video when this wire=12V.

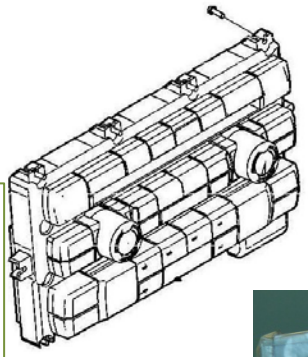
white: switch signal when =12V.[max 25V]

GRAY: specific control signal from the CAN box, do not connect to anything.

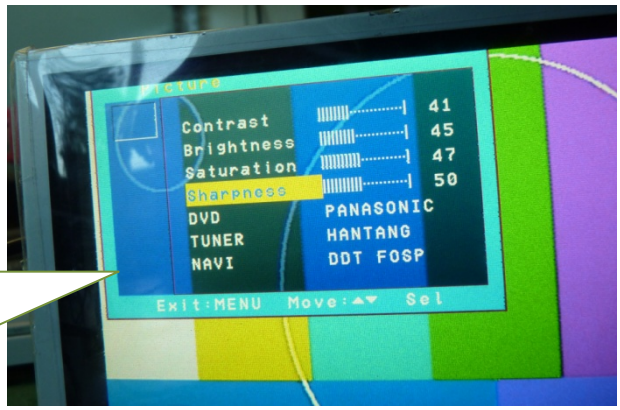
The Ford monitor has a 4Pin LVDS connector, connecting the CD/Radio unit and the Monitor. The connector to monitor should be inserted to this video interface's CAR-In socket



Then the interface's LVDS tail plug should be inserted onto this monitor's rear socket. Which was used by CD's 4Pin connector.



- When the 3 side keys are pressed, the selected item will traverse among the menu, while +/- will modify the values.
- This OSD selection is only available to video input, the RGB-navi already been tuned to have nice color.
- The DVD/TUNER/NAVI option is to set the IR output to the video source, so the user can use touch screen to control DVD and other video source operations. Disable this function by set the DVD/TUNER/NAVI type to "None"[or do not connect the touch daught PCB to the Ctrl port]. set it to "PROG" if the DVD/Tuner type if it is not listed inside.



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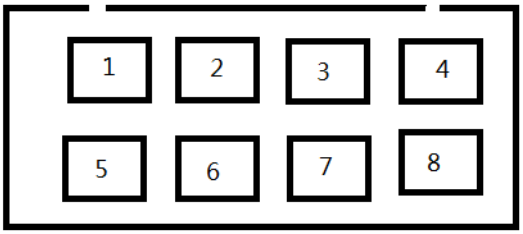
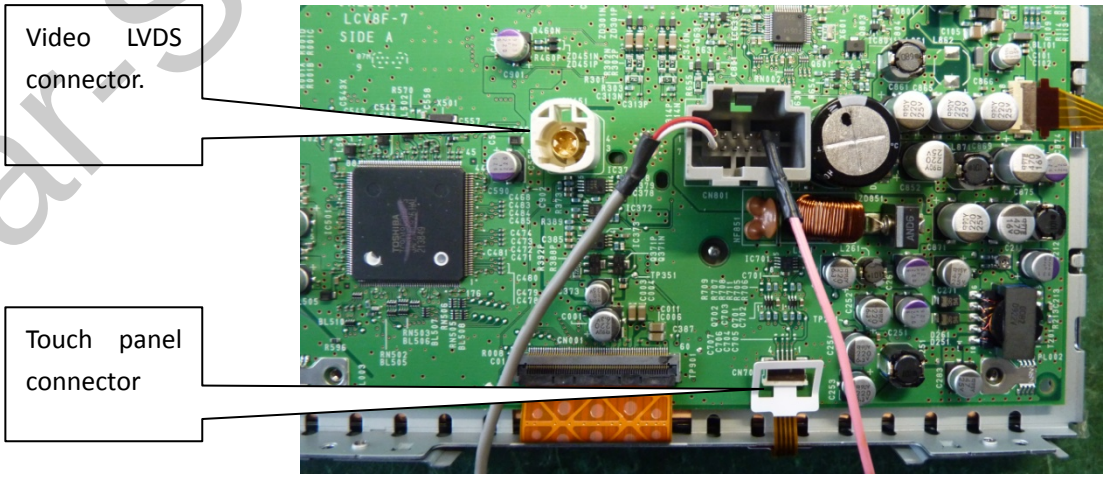
2. The Ctrl port.



The Ctrl port has 8 pins, it is not necessary for the installers to use it in most cases, however it can be used for installer's convenience in case many more extra devices are installed.

Pin 1, Pin2	+5V output voltage for sound switch relay when AV1 is selected, 0V when AV2 selected. [max output=2A, while most mechanical relay only needs 0.1~0.3A.]	All ford cars have an AUX stereo input, which can be connected to the external audio input. If the installer needs to send 2 or more extra audio into the car speaker, one mechanical relay should be used to switch the sound. This pin can pull the relay with +5V.
Pin3:	constant +5V when the unit is working.	max 2A output.
Pin 4,8	GND	It is tied to GND inside.
Pin 5:	data bus for touch screen	Pin5,6 should NOT be connected to GND, because it will halt the CPU inside. Leave it open for normal use.
Pin 6:	clock bus for touch screen.	
Pin 7	+5V output voltage for touch screen switch relay, when in inserted video mode, this pin=5V, when in original car video mode, this pin=0V.	For imported cars which needs touch screen for installed navigation computer, this voltage can be used to switch the original touch screen. max 2A output.



3.Touch screen operation

Users may use the original touch panel for inserted navi operations, which is needed for imported cars, then the touch screen switch PCB is needed and should be wired in this way:

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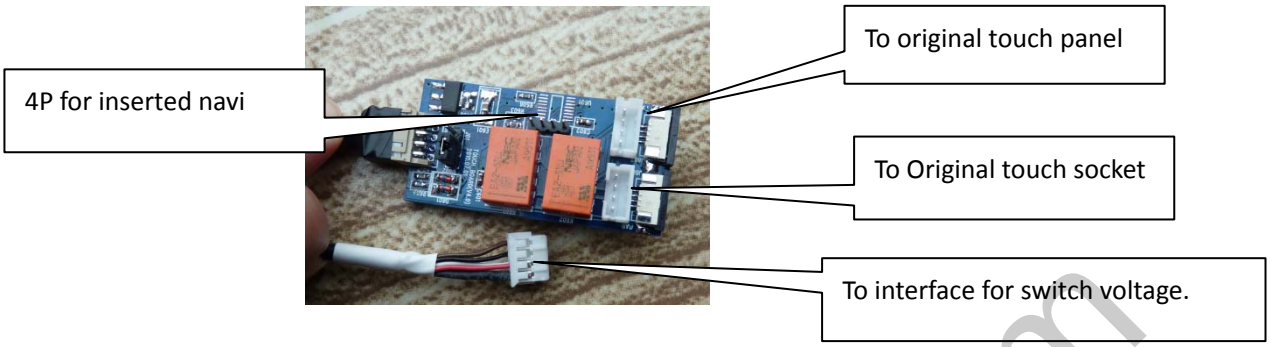
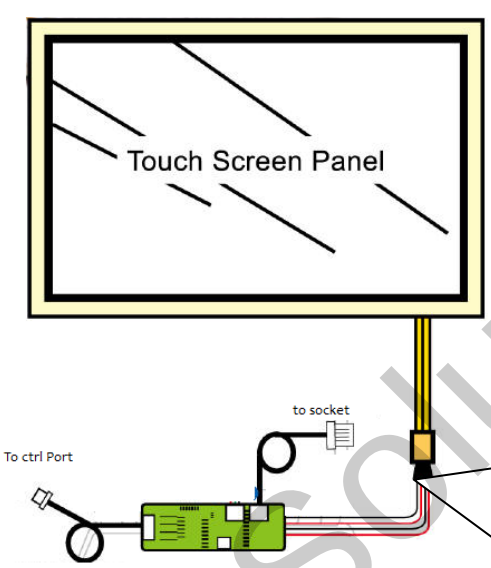
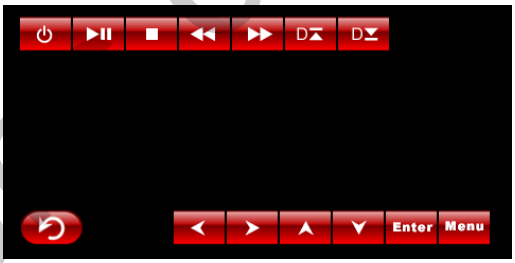


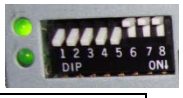
When the touch screen is not used for navigation, it can also be used for DVD/TV control for installed device.





When this daughter PCB is inserted, the user touch the panel, this touch icons will pop out, and the user can control DVD/TV with it.

The 3 keys can choose the DVD/TV type connected to this unit.
If the installer do not want these icons to pop out, set the DVD/TUNER options to be “None”.



DIP switch setting:

DIP	=ON [DIP=Down side.]	=OFF
1	RGB enabled	RGB disabled.
2,	AV1 for DVD enabled	AV1 disabled
3	AV2 for Tuner/MP5 or extra video enabled	AV2disabled
5	This is reverse camera trigger wire go to CAM when Green wire= 12V]	go to car video when Green wire= 12V
6	Touch screen IR learn for re-installed navigation or DVD or tuner.	Set to OFF for normal use.

4. Parameters

No.	name	parameter
1	RGB video amplitude	0.7Vpp with 75 ohm impedance
2	sync amplitude in RGB-navi port	3~5Vpp with 5K ohm impedance Sync should be NTSC composite with negative polarity.

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3	RGB resolution	NTSC-RGB navigation, that is. 320X240,400X240,480X240 [vertically some computer only output 234 line,it is also compatible]
4	Av1,Av2, cam video	0.7Vpp with 75 ohm impedance NTSC/PAL/SECAM automatic switch
5	IR RGB, IR_AV1 output	3.3V digital infrared control code with 4 data bytes [machine code1,machine code 2, user code, verification code]
6	Normal Power consumption	2.4W [0.2A @12V]
7	Standby current	< 10uA
8	Reverse trigger threshold	>5V trigger
9	Ctrl port Pin1,2 and Pin7: Output voltage	Relay pull voltage for Audio and touch screen selection 5V volts.
10	Ctrl port Pin1,2 and Pin7: Current	2A. Tested to have no damage when short-circuit to GND for 2 minutes. Leave it open when do not use.
11	Work temperature	-40 ~ +85C

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Appendix:

Original touch panel for extra devices(IR output operations):

When the touch-daughter PCB is connected, touch control for extra DVD/IR may be activated. The user does not need the remote controller any more.

The Ford screen already has a very nice touch screen on top of the LCD.

A. Hardware description of the touch-daughter-Pcb:

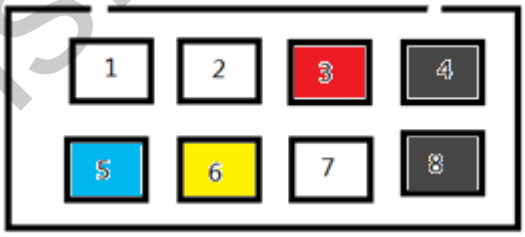
This touch daughter PCB has a touch-in(marked with "PNL") and touch-out connectors(marked with "CAR"), both are 4pin. Both in&out connectors have two types of socket: SMD and DIP. Mechanical relay is used inside to make sure PNL-CAR short-circuit for original applications.

The PNL socket should be connected to original touch-panel-plug with the accessory socket.

The CAR socket should be connected to original touch-panel-socket with the accessory ribbon wire.

Then the touch panel is shared by installed extra device.

The daughter PCB is connected to the interface with this connector→[View on the interface]



Pin3 ,4,8: power supply

Pin5,6: communication data bus.

Pin 1,2: =5V when AV1 selected.

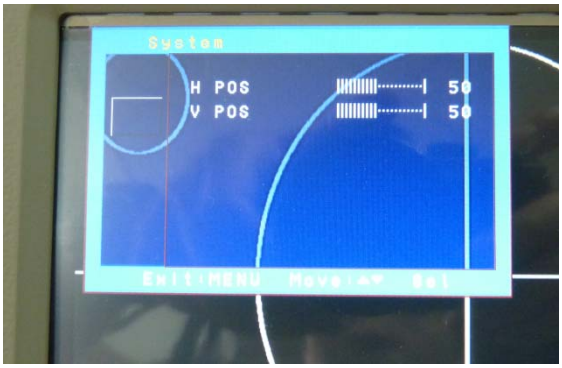
Pin 7: =5V when in inserted video mode.

The control signal is wired to pin1,2, so touch may be used for AV1 only.[default]

The installer may taked the pin out and wire it to Pin7, so touch may be used for whatever inserted video mode.

B. 3 key buttons

The input box has 3 side keys, the installer may use it to tune the picture display, and touch function for the connected DVD or other devices. The 3 keys are : menu, +, -.



- When menu key pressed 1st time: the left OSD options will be shown,
  when pressed 2nd time: the right OSD options will be shown,
  when pressed 3rd time, the osd window will disappear.
- The user may use the +/- key to go to the edit mode of each item, and use menu-key again to go down to the next item.
- The DVD, TUNER,NAVI items mean the IR output of RGB,AV1,AV2 input respectively, there are already

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many types of DVD, TV tuner and NAVI brands programmed inside.

The installer may also set it to be “PROG” if the video source brand is not listed inside. Then he may pull the DIP6 DIP down to program the IR code.

The installer may also set it to be “NONE” if he does not want the icons to pop out when people control it. In this case, the user may also touch the left-top corner[‘power’ icon] to tuner off the monitor, and he may also use the left-button corner, [‘SRC’ icon] to switch the input.

- The H POS, V POS items mean the image location on monitor, different video players like DVDs may send out video with different amplitude, different image location although it is PAL or NTSC. These 2 options will give the installer the convenience of adjusting image perfectly centered in a couple of seconds.

C. IR learn operations

The input box has separate memory space to remember the IR code of every input[RGB input,AV1(DVD),AV2(Tuner or iPod)].

1) When the current input channel’s IR output is set to “PROG”, the input box goes into IR learn mode when the DIP6 is pulled down to ‘ON’ state.
2) Then one icon will be blinking,saying that one IR key press is needed, the installer need to point the remote controller toward the whole on RGB input.
3) When one code is learned, another icon will be blinking, saying that another IR code is needed. The installer then repeating step 2), until all codes are programmed. Then the icons disappear automatically and the installer may start normal operation.

- the touch screen will not acknowledge touch screen operations when it is in programming mode, except the ‘SRC’ key, which will terminate the learning progress.

D. Touch panel calibration

- When the DIP6 is pulled down to ‘ON’ 5 times repeatedly, the monitor goes into touch screen calibration mode, a cross will be shown on screen, and the installer need to use something like a pencil to hit the cross, the cross will be changed to another location is one point is recorded.

  This multi-point calibration should be done at least once by the installer guarantee precise icon operation to the user and remove piece to piece resistance difference between panels in different cars.

E. IR code out for video source devices

The input box can output the IR code in a 4-byte protocol which most of AV devices use today, the output can be 2 ways:

(1) wire connect way without carrier frequency, or
(2) wireless way with carrier frequency.

The difference is: the wireless way says the signal ‘1’ with 38K frequency pulses while the wire way says by just voltage. See picture below.

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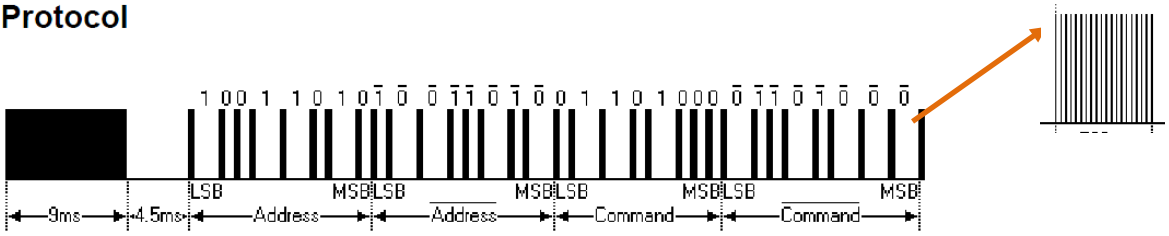
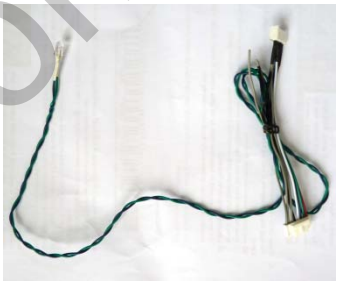
Protocol



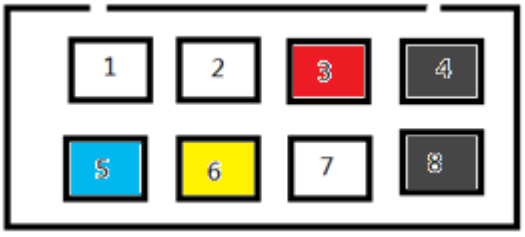
- The input box has 2 IR output pins: IR-RGB(the 6th pin of RGB input), and IR_DVD(the 7th pin of RGB input).
  The IR_RGB is always in wire-connect way without carrier,
  while the IR-DVD pin can be wire-connect[When Dip7 is high in OFF state],or in a wireless way [When Dip7 is low in ON state, in this case, the transmitter should be used on the iR-DVD line].
  The IR_RGB and IR_DVD send the IR code out in RGB,AV1,and AV2. The video source choose to acknowledge because the data bytes values are different.[the 4 data bytes say the device by the first 2, and 3rd byte says the key value, the last one is the verification]



  - When the installer use the IR-RGB or IR_DVD without carrier frequency, he needs to connect the IR output wire to the ir-sensor's signal wire.[all ir-sensors have 3 wires inside, +5V,GND, and signal]

F. Original touch panel switched to extra navigation unit

For imported cars, Users may use the original touch panel for inserted navi operations, which is very important for imported cars, then the touch screen switch PCB is needed and should be wired in this way:



In this case, the installer does not need the DVD-touch PCB, he may just use the socket of the interface(picture here→), and use 2 mechanical relays.

Connect the relay's+ to pin7, and

Connect the relay's- to pin8,

When the screen shows the inserted video[RGB,AV1,AV2..] pin7=5V, when the screens shows the original video, pin7=0V.

When the relay is switched with 5V, the 4Pin original touch is switched to the inserted navi.

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